

SURGICAL CASES

IN 1867.

BY DAVID W. CHEEVER, M.D.

SURGEON TO THE BOSTON CITY HOSPITAL.

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SURGICAL CASES.

CASE I.—*Naso-pharyngeal Polypus, attached to the Basilar Process of the Occipital, and Body of the Sphenoid Bones, successfully removed by a Section, Displacement, and subsequent Re-placement and Re-union of the Superior Maxillary Bone.*—(Service of Dr. CHEEVER.) The patient, a student, eighteen years old, entered the Hospital, July 20th, with the following history:—

About two and a half years ago he had profuse epistaxis, which continued twenty-four hours. During the six months next following this, he had only occasional slight attacks. At the end of that period he found that his right nostril was wholly obstructed, and he has never since been able to blow through it. He soon became aware of a growth behind that nostril, which gradually but steadily increased, until within a few weeks of the time of entrance, when it grew rapidly. There was some discharge, but it was not offensive until quite recently.

At the time of admission to the Hospital, the soft palate was found to be depressed and pushed forward until it hung at a right angle with the hard palate, and both it and the tonsil were inflamed. At the right side of the fauces a small ulcerated patch could be seen. By the finger, a tumor could be felt behind the soft palate, firm, full and lobulated, and extending farther up than the finger could be carried. Its lower lobes hung down into the throat. The whole of the upper part of the pharynx was occupied, except a small space on the left side. Nothing could be passed into the pharynx through the right nostril, but the left was clear. Hearing was imperfect in the right ear; and the respiration was mostly through the mouth. The microscopical examination of the debris of the tumor, removed by a digital examination, revealed only blood corpuscles, pus cells and *fibrous* tissue. There was no evidence of malignancy.

The patient was able to take liquid or soft food only. The general health was good, with no hereditary predisposition. He was very desirous of an operation for the removal of the tumor.

There was no question that the tumor must be removed, or, before long, cause the death of the patient. The problem to be solved was as to the best method of operating. Three modes offered themselves for consideration.

1st. By ligature, or the *écraseur*, through the nares. This was impracticable, because nothing could be passed through the right nostril opposite to which the bulk of the tumor lay; also because it was not a pedunculated growth. Were it practicable, it could only cut off the growth, without eradicating it; and it would, probably, speedily recur.

2d. By section of the soft palate, of the hard palate, and removal through the mouth, with a subsequent operation for staphylophary. This mode, advocated and revived by Nélaton, but really as old as Hippocrates, was abandoned on account of the size and high attachments of the tumor, and the fear that room enough to manipulate could not be got through the section of the hard palate.

3d. By removing the superior maxilla—a plain and easy way, but accompanied by deformity and serious mutilation. Here was a young man with a healthy jaw and perfect teeth, and the disease wholly behind it. Could a portion of the jaw be saved? or even the whole replaced? I decided to make a horizontal section of the jaw; depress it, saving all attachments of the soft parts possible; see if the tumor could thus be reached; and, if practicable, to replace the jaw, and try to save it.

July 23d.—*Operation.* The patient was etherized during the first part of the operation, and partial etherization was renewed at intervals; he was seated in a chair, with the head on a pillow.

An incision was made from just below the inner canthus of the right eye, downwards by the side of the nose, following the nasolabial fissure, to the corner of the mouth. The inner flap was dissected up until the symphysis was exposed; and the outer, until nearly the whole of the superior maxilla was free. With a narrow-bladed saw, about three inches long, the superior maxilla was now divided transversely, about half an inch below the floor of the orbit. The blade of the saw was plunged into the zygomatic fossa, and the front and back walls of the antrum were sawn through horizontally, starting just below the articulation with the malar bone, and terminating in the anterior nares, at the lower end of the nasal bone. The ala of the nose having been lifted up, the right central incisor was next extracted. Strong bone forceps were now used to divide the alveolar process, through the socket of the right central incisor. The cut included the *alveolus only*. The hard and soft palate were not touched. The bone was now held by the palate process, palate bone, and its co-ossification with the pterygoid processes. Seizing the alveolar process with strong tooth-forceps, the whole section of the superior maxilla was bent down and displaced into the mouth. The antrum was found to be filled by one lobe of the tumor without

attachment, while the body of the tumor was attached to the upper, back part and right side of the pharynx and to the base of the sphenoid bone. The body was very firm, and the attachments were broad, covering a space two inches square. These, with considerable difficulty, were severed by scissors, introduced through the opening above the depressed section of the superior maxilla, and the base was cauterized repeatedly with strong nitric acid. The hæmorrhage, which was not excessive, was thereby effectually checked. Four ligatures were applied to bleeding vessels in the course of the first incisions. With the forefinger of the right hand in the throat, and the left in the cavity above the section of the maxilla, they could be made to meet freely, and explore thoroughly the pharynx, which was now found entirely clear of obstruction.

The superior maxillary bone was now hanging with its antrum exposed; and attached by the bent, or broken hard palate, the unbroken soft palate, and the broken osseous, and unbroken muscular and vascular attachments of the pterygoid process of the sphenoid bone. On these attachments we were to rely for the restoration of the bone. The maxilla was easily pushed up into its place, and held by a silver wire passed round the left central, and right incisor teeth; and by the closing of the lower jaw. The flaps of skin were accurately approximated, and united in place by six interrupted sutures.

At the close of the operation, the pulse was 120 and of fair strength. Wine, iced milk, beef tea and opium were ordered, *pro re natâ*. 7 P.M. Pulse 132. Reaction good. Takes nourishment freely. No vomiting or pain. Urine free. *R.* Pulv. Doveri, grs. x. 10 P.M. Sleeping quietly. Pulse 88. Respiration free.

July 24th, A.M.—Pulse 120, good. Patient in good spirits. Face drawn a trifle to left side. There is a little swelling of the face, and some offensive odor from the clotted blood. The parts syringed with *R.* Tr. myrrh., $\frac{3}{4}$ i.; aqua, $\frac{3}{4}$ iv. M. P.M. Pulse 130. No pain. Takes beef-tea, milk, eggs, &c., freely. Sleeps considerably. Functions regular.

July 25th.—Pulse 96. Except some drowsiness, feels very well. Appetite good. Sutures removed, and good union found. Eye nearly closed by adjacent swelling. The nares and pharynx to be syringed twice a day.

July 26th.—Pulse 112. Looks brighter. Eye very much better. Union of flaps quite firm.

July 28th.—Improving. Discharges more moderate and less offensive. Upper jaw in good position, having fallen only a very little. Appetite good; bowels regular; sleeps well; no pain.

July 29th.—A small swelling of palate just behind incisor teeth lanced. Discharge of pure blood. General condition of patient as good as usual.

July 30th.—Ligatures all away. External wound entirely healed.

Aug. 1st.—Quite comfortable. Discharge diminishing. A small piece of gutta-percha was moulded between upper and lower jaws of right side, and a bandage around the head and chin to keep the bone up in place.

Aug. 3d.—Steadily improving. Jaw in good position.

Aug. 5th.—Discharge from right nostril about normal. Patient walks about Hospital grounds, without suffering any inconvenience or pain.

Aug. 12th.—Still doing admirably. *No purulent discharge.* Some pain on pressure where the jaw was sawed across. Plug between jaws continued. No appreciable motion of parts of bone.

Aug. 22d.—Progressing very favorably. Bandage and gutta percha removed. Union of maxilla firm. Four weeks since operation.

Aug. 28th.—Discharged at his own request, well. Still wearing the wire about the teeth.

Sept. 2d.—Reported himself at the Hospital, in excellent condition. The wire removed. Union perfect; able to chew; now six weeks since the operation. Respiration clear. Examined with the rhinoscope by Dr. Langmaid, and the pharynx found healthy. A slight catarrh from the right nostril; nothing more.

CASE II.—*Popliteal Aneurism treated by Flexion. Recovery.*—(Service of Dr. BUCKINGHAM.) E. B., æt. 40, a laborer, entered the City Hospital March 13th. His health had always been good. Ten weeks ago, he first noticed a swelling in the right ham, which has slowly increased in size since. He can assign no cause for its appearance. It has begun to be somewhat painful of late; darting pains shooting through the calf.

Now, has a pulsating tumor, three inches long and one and a half broad, in the right popliteal space. No redness; no œdema either there, or below in the foot. No tenderness on pressure. The swelling is even, fusiform and smooth; and seems like a dilatation of the popliteal artery, gradual, uniform and not diffused.

Compression over the femoral artery checks all pulsation in the tumor. Flexion of the leg on the thigh stops the pulsation in the tumor, as well as in the anterior and posterior tibial arteries.

After consultation, a trial of the treatment by *flexion* was decided on.

Flexion was begun March 20th, and morphia subcutaneously ordered, when needed. Flexion was borne by the patient only about sixteen hours, and even then with some minutes of occasional extension. At no time was the current wholly stopped in the tumor, but only retarded. At the end of this period of about *sixteen hours*, the tumor had changed in appearance. It was somewhat shorter and very considerably wider than before. The patient was unwilling to have the leg flexed again, on account of the pain, and it was determined to wait and see the result.

March 22d, the following day, the tumor had diminished in size; there was only a feeble pulsation, and very little pain.

23d.—Tumor hard to the touch. *No pulsation in it, or the tibials below. Two days only since flexion was discontinued.*

31st.—Tumor has been quite tender to touch. Now, less so. No return of pulsation.

April 5th.—Tumor diminishing in size. No pulsation below tumor yet.

13th.—About this time pulsation was detected feebly in the dorsalis pedis artery; between three and four weeks since the operation.

30th.—The circulation of the foot is perfectly restored; now about six weeks since flexion. The aneurismal sac has shrunk up, and remains without pulsation, hard, and not sensitive.

May 10th.—He was discharged, well.

CASE III.—*Popliteal Aneurism treated by Acupressure. Recovery.*—(Service of Dr. CHEEVER.) The patient is 30 years old, by occupation a bootmaker. He entered the City Hospital July 30th, 1867, having noticed, seven months previously, a small tumor in the left popliteal space, which was quite painful. The pain had continued, at intervals, up to the time of admission, and was aggravated by fatigue, especially after unusual exercise in walking. The tumor grew slowly, and it was noticed that the leg was at times considerably swollen.

The aneurismal tumor, at entrance, was situated in the left popliteal space. The difference in the circumference of the two legs at the knee was about two inches. The patient's condition was otherwise good; appetite, pulse, and functions generally, all normal.

On the day after entrance to hospital, *treatment by flexion* was commenced. The leg was flexed on the thigh, and retained in position by proper straps. Complete flexion almost entirely controlled the pulsation of the aneurism, but this at first was not persisted in. One fourth of a grain of sulphate of morphia was ordered *pro re nata*. Flexion was commenced at 2, P.M., July 31st.

Aug. 1st, 6, A.M.—Severe pain until 11 o'clock last night; relieved by morphia. Not much sleep during night. Is now quite comfortable. 9.30, A.M.—Severe pain in knee. Morph. sulph. gr. $\frac{1}{3}$. 10.30, A.M.—Pulse 96. Leg and foot somewhat swollen, and temperature increased. Pain less. 2.15, P.M.—Pulse 92. Sole of foot feels as if "needles were sticking in it." 8, P.M.—Pain in knee continues. Morph. sulph. gr. $\frac{1}{3}$.

2d, 6.30, A.M.—Slept well last night. Quite comfortable now. Tea and toast for breakfast. Pulsation to be felt distinctly. 10, A.M.—Morph. sulph. gr. $\frac{1}{4}$, subcutaneously. 4.15, P.M.—Flexion discontinued and leg extended. Pulsation seemed weaker. 6.30, P.M.—Flexion renewed (45°). 7.15, P.M.—R. Morph. sulph. gr. $\frac{1}{3}$, subcutaneously.

3d, 8, A.M.—Slept well until 2, A.M. Leg extended. Pulsation about the same. 10.30, A.M.—Flexion renewed as before. 3.15, P.M.—Morph. sulph. gr. $\frac{1}{3}$, subcutaneously. 8, P.M.—Leg extended for the night.

4th, 7, A.M.—Comfortable night. Pulsation same. Leg flexed at an angle of 45° . Foot and leg swollen and œdematous. 11, A.M.—Flexion increased by one half by tightening straps. 12, M.—Pain severe through the knee and foot. Morph. sulph. gr. $\frac{1}{2}$, subcutaneously. 8, P.M.—Pain continues. Morph. sulph. gr. $\frac{1}{2}$, subcutaneously.

5th, 7, A.M.—Flexion remitted. The dimensions of the tumor are now as follows:—Transversely, four and a half inches; longitudinally, three and a half inches. Pulsation as strong as before treatment.

The following synopsis will exhibit more succinctly the times of flexion and extension. Treatment by flexion lasted 118 hours; or five days and nights, lacking two hours.

The first period of flexion at 45° was 52 hours.

"	second	"	"	"	13 $\frac{1}{2}$	"
"	third	"	"	"	9 $\frac{1}{2}$	"
"	fourth	"	"	drawn up tight,	24	"

Flexion, 99 "

Relaxation 2 hours.

"	2 $\frac{1}{2}$	"
"	11	"
"	3 $\frac{1}{2}$	"

19 "

99 hours of flexion out of 118 hours of treatment.

It seemed idle to pursue this method farther. The patient was getting depressed by it, and no sign of consolidation appeared in the tumor. On the contrary, the latter looked as though it might become diffused before long.

Treatment by any form of pressure was therefore abandoned. And it remained to resort to the ligature or to acupressure. The latter was decided on.

Aug. 6th, 11, A.M.—*Operation*. The patient was fully etherized. The leg and thigh were flexed and rotated outward. An incision about two inches in length was made in the apex of Scarpa's triangle, parallel with the inner margin of the sartorius muscle. The femoral artery was readily reached, and a curved director was passed beneath it. The long saphenous nerve was drawn outwards. An ordinary shawl pin, with a large glass head, was passed from without inwards obliquely through the skin and subjacent muscle (sartorius). It entered at a point one inch external to the incision, and was directed obliquely downward and inward, so as to cross the

artery above, and to pass between it and the vein. The point was then directed downward to pierce the adductor muscles beneath the vein. It was hoped thus to compress the artery, without pressing on the vein. This manœuvre failed to control the pulsation, and was abandoned. The artery being lifted on a director, the acupuncture needle, piercing the sartorius and crossing over the artery as before, was now passed between the artery and vein, and the point turned outwards along the director, and beneath the artery, until it pierced the rectus muscle and rested on the femur. Thus the artery was lifted away from the vein, and compressed between the pin and the sartorius and skin.

All pulsation immediately ceased in the aneurism and below. The wound was closed externally by three wire sutures, the pin being left in place, with the head alone protruding. 12, M.—Patient was placed in bed, with leg slightly flexed. Special watch.

Having observed the great rise in temperature following lesions of the sympathetic nerve in the lower animals, through some impression, probably, conveyed to the *vasa vasorum*; and having also noticed a similar increase of heat after the ligature of large vessels, I directed that the limb should not be packed in wool, as is ordinarily done after ligature, but be left uncovered, and the temperature carefully watched. External warmth was to be applied if the heat of the limb or foot fell below that of the other. 12.52, P.M.—Temperature in axilla, 98.5° ; in groin, 97.25° . Left leg (the leg affected), four inches below the knee, 95.5° ; right leg, four inches below the knee, 93.5° . 2, P.M.—Recovered from effects of ether. Complains of darting and stinging pains in sole of foot, calf of leg and seat of aneurism. 5.15, P.M.—Temperature the same. Pain continues, with slight twitching of muscles of calf. Milk *ad libitum*, and sulphate of morphia to be given *pro re natâ*. 6, P.M.—Pain undiminished. Morph. sulph. gr. $\frac{1}{4}$, subcutaneously. 8, P.M.—Pain continues. Morph. sulph. gr. $\frac{1}{3}$, subcutaneously. 10.15, P.M.—Slight spasmodic contractions about seat of aneurism. No pulsation. Pulse 88. 11.45, P.M.—Very restless. Morph. sulph. gr. $\frac{1}{3}$, subcutaneously. Very slight oozing from the wound.

7th, 6.30, A.M.—Rested well the latter part of the night. One dejection at 4, A.M., and another now. Darting pain in leg and popliteal space. Aneurismal tumor smaller, hard and tender. Leg and foot somewhat swollen and œdematous. Twenty drops of tincture of opium to control tendency to diarrhœa. Milk and cracker for breakfast. Pulse 96. 8, A.M.—Vomited soon after taking laudanum. One loose dejection. Morph. sulph. gr. $\frac{1}{4}$, subcutaneously. Tongue dry and coated. Much thirst. Broken ice by mouth. 10.30, A.M.—Drowsy. No very severe pain. Diet of milk porridge and boiled milk *ad libitum*. 12.35, P.M.—Two discharges since last record. Pil. opii gr. $\frac{1}{2}$, after each dejection. 2.30, P.M.—Feels quite comfortable. Pulse 104. One dejection. Continue opium

pill. 4.25, P.M.—Pain in popliteal space. Morph. sulph. gr. $\frac{1}{4}$, subcutaneously. 8, P.M.—Diarrhœa continues. Opium pill. Some swelling noticed about incision.

8th, 2.30, A.M.—Restless and retching. Pulse 100. Morph. sulph. gr. $\frac{1}{4}$, subcutaneously. 10.45, A.M.—Slight blush about wound. Sutures removed. No pus, and only a drop of serum. Warm fomentations to wound. Apparent temperature of left foot lower than that of right; foot covered with cotton. Face flushed. Pulse 120. Ice to tongue. 2, P.M.—Quiet and comfortable. Pulse 112. 6.15, P.M.—Quite comfortable. Wound surrounded by swelling and redness, which tend to increase. Aneurism less tender. Leg and foot less swollen. Pain of sole and toes of left foot, with pricking and darting. Patient in good spirits.

9th.—Had a good night. Reports himself “feeling splendid” at 7, A.M. Blush about the same. Twitching of muscles all gone. Swelling of foot and leg less, and tenderness of the tumor much diminished. Fomentations still continued. Sensation in left foot less acute than in right. 12, M.—The pin removed, exactly seventy-two hours after its insertion. No pus or serum followed. Pin perfectly dry. No pulsation in popliteal tumor or in foot. Tumor diminishing in size. The incision above had apparently closed by first intention, yet it was thought that fluid could be detected beneath. The blush was a little increased; fomentations continued. Diet—tea and toast. *R. Tr. ferri mur. gtt. xx. ter die.* 7.30, P.M.—Doing nicely. Morph. sulph. gr. $\frac{1}{8}$, subcutaneously.

10th, 7, A.M.—About two drachms of pus pressed out from beneath incision. Pulse 90, strong. Blush about the wound much less. Appetite improving.

11th.—Small discharge of pus. Swelling less. The blush nearly all gone. Pulse 76.

12th.—Comfortable night, with opiate. Incision granulating. P.M.—Sat up in chair an hour. Sensation returning in sole of foot.

13th.—Continues to improve. Discharge from wound slight. Fomentations to thigh and wool to foot continued.

14th.—Doing well. Apparent temperature of left leg *higher* than that of right, as determined by the hand.

15th.—Progressing favorably. Temperature—left leg (the one operated on) at calf, 96.5° ; right leg do., 92.5° ; left foot between toes, 94° ; right foot do., 92° .

16th.—Very slight discharge. Incision one half closed. Temperature unaltered. To-day, for the first time since operation, tickling of the sole gives reflex motion.

17th.—Sits up more or less every day. Discharge from wound very slight, and does not increase on pressure of adjacent parts. Patient can move leg and foot without discomfort. Temperature—left leg at calf, 96.5° ; right leg do., 93° ; left foot between toes, 97° ; right foot do., 92.5° . Has taken every night at bed-time, since Aug. 12th, morph. sulph. gr. $\frac{1}{16}$ — $\frac{1}{8}$, subcutaneously.

18th.—Improving. Fomentation omitted. Simple cerate dressing. Temperature—left leg at calf, 97.5° ; right leg, 95.5° ; left foot, 98° ; right foot, 92.5° . Opiates omitted. *R.* Potassii bromid. grs. xxx. at 7, P.M.

19th.—At 2, A.M., a slight oozing hæmorrhage occurred from wound, apparently of venous blood. Yesterday, without permission, patient walked about ward on crutches, dragging his left foot, and during last night he moved his leg and foot considerably in bed. Hæmorrhage easily controlled by pressure. 9.30, A.M.—Slight hæmorrhage renewed; controlled readily by ice to part. 7, P.M.—*R.* Morph. sulph. gr. $\frac{1}{8}$, subcutaneously.

20th.—Rested well last night without recurrence of hæmorrhage. Quite free discharge of bloody pus from incision. Warm fomentations applied to part. Slight darting pain in foot. Temperature—left calf, 96.5° ; left foot, 98° ; right calf, 94° .

21st.—Comfortable and doing well. Discharge nearly ceased. Fomentations omitted. Temperature—left calf, 95.5° ; left foot, 96.5° ; right calf, 93.5° .

22d.—Doing well. No pain in leg or foot. Temperature—left calf, 93.5° ; left toes, 93.5° ; right calf, 92.5° .

23d.—Improving daily. Incision nearly healed. No pus. Takes potass. bromid. grs. xl.—lx., in divided doses after 3, P.M. Sleeps well. Temperature—left calf, 95° ; left toes, 95.5° ; right calf, 94.5° ; right toes, 96.5° .

24th.—Leg and foot appear of natural color, but the foot still feels slightly numb. Temperature—left calf, 95.5° ; left toes, 96.5° ; right calf, 94° ; right toes, 96.5° .

25th.—Discharge just enough to slightly soil dressings. Patient walks about ward with crutches, and can bear some weight on left foot. Temperature—left calf, 96° ; left toes, 95° ; right calf, 93.5° ; right toes, 95.5° .

26th.—Incision almost well; small granulating spot. Leg and foot are in every respect normal in appearance and condition, except in temperature; and the left foot is slightly more sensitive than the right. There is no tenderness in popliteal space. Aneurismal tumor small and very hard. Discharged, well—twenty days after operation.

It will thus be observed that throughout the period of acupressure, and even until his discharge, the temperature of the left (operated) limb was uniformly higher than that of the other. Unfortunately, in the midst of the case, the thermometer constructed to take the temperature was broken, and several days were lost before another could be obtained. It was during this interval that the *apparent* temperature of the toes to the hand seemed slightly lower than that of the other foot, and I therefore applied cotton to the foot, but no higher up the limb.

May it not be that external warmth applied after ligature pro-

motes gangrene, by favoring and increasing the passive congestion which exists already? Such we know to be the action of warm poultices in the congestive stage which precedes senile gangrene.

I am inclined to think that the suppuration which followed the acupressure was due to long and rough manipulation in securing the vessel. Could the last manœuvre adopted have been foreseen and used first, I think laceration and stretching of the sheath and cellular tissue might have been avoided.

The peril of secondary hæmorrhage from the vessel divided by the ligature was avoided by acupressure.

It may be noticed in the first case reported, that flexion, for a few hours only, altered the sac so that consolidation took place promptly. In the second case, flexion was pursued over four days and nights constantly, but without effect. The difference in result, I think, is due to the fact that the first tumor was very small, fusiform, and easily compressed; the second was very large, flattened, and tending to become diffused.

Flexion so long in the second case may have enlarged the collateral vessels, and put them into a better state to sustain the circulation after acupressure of the femoral artery.

One month after leaving the hospital, the patient continued perfectly well.

CASE IV.—*Excision of the Hip. Recovery.*—(Service of Dr. BUCKINGHAM.) Feb. 12th, 1867. F. T., æt. 14, of scrofulous parentage, was healthy until last September, when he began to have pain and stiffness in left hip. Soon after, had an attack of fever lasting three weeks; was confined to his bed thirteen weeks, being much reduced, with night sweats and emaciation. During this time an abscess was opened below the trochanter major, and it has ever since discharged pus freely, with, occasionally, small fragments of bone. He has grown feeble, pale and thin. Appetite good. No cough. The thigh is held persistently flexed. The nates are flattened, and there is a good deal of swelling. Great pain on moving the limb.

He was put to bed; extension by weight applied, and the syrup of iodide of iron given.

Feb. 15th.—Unable to bear weight.

20th.—Discharge more profuse; patient more feverish and feeble.

24th.—A painful diarrhœa; treated by astringents and opiates.

March 1st.—Diarrhœa better. Less pain, but cannot bear extension. Lies with leg drawn up constantly.

5th.—More sallow and emaciated daily.

10th.—Is very weak.

13th.—Return of diarrhœa.

14th.—Extremely pale, thin and exhausted, with diarrhœa, hectic and suppuration. Appetite, however, good.

The patient was now so excessively reduced that it seemed an

open question whether he would survive more than a few days. It appeared very doubtful whether it was expedient to interfere with the apparent course of this disease to a fatal result. Nothing could be done, unless by operation. Without interference, he was slowly sinking. After weighing well the probabilities of the course to be pursued, Dr. Buckingham determined to give him the benefit of the only doubt which presented itself, and, with his consent, to cut open the joint and remove the diseased bone, or so much of it as may be practicable.

Operation.—March 15th. After etherization, an incision, V-shaped, point downwards, was made over the joint. The muscles were dissected away from the great trochanter; the chain saw was passed beneath, and the femur sawn through just below the trochanter. The head of the bone was now seized with heavy clawed forceps, the muscles dissected back from the acetabulum, the capsule opened, and the head and neck of the femur removed. The ligamentum teres had disappeared, but the head was not dislocated. The head of the femur was extensively eroded. The acetabulum was carious, and a few loose pieces were removed. The hæmorrhage was slight; some small vessels were tied, and the wound filled with a sponge. Stimulants and morphine were given. After the operation, the pulse was 140, and very compressible. One hour later, pulse 150, and weaker. Ten drops of tincture of opium were given in milk.

In the afternoon, a Smith's anterior splint was applied, from the toes to the abdomen, keeping the leg quiet. At 6, P.M., pulse 150; sleeping. Milk punch was ordered, during night.

March 16th.—Pulse 140. Much irritative fever.

17th.—Pulse 140. One egg for breakfast. Sponge removed from wound.

19th.—Pulse same, but he looks better. Granulations appearing.

20th.—Odor less offensive. Pulse 140.

24th.—Wound measures four by five inches. It is filled with healthy granulations. General condition improving.

28th.—Wound contracting.

31st.—Appetite better. But little pain. Wound discharges healthy pus. Appearance of countenance better.

It was now, a fortnight since the operation, evident that he had rallied from the shock, and was going on favorably. Improvement was, necessarily, excessively slow, and could be measured only by months.

April.—The wound continued to close.

May.—He improved, but suffered much from bed-sores, being very emaciated.

June.—He was put into a basket, and taken out of doors daily—and from this time a very marked improvement began.

July.—He was encouraged to use a little passive motion of the

legs, daily. The wound was closing; a fragment of carious bone was discharged.

August.—He steadily gained, until the 27th, when he was discharged; five months since the operation, and one year since the beginning of the disease.

At this time his condition was as follows:—Face round, fat and sun-burned. Appetite excellent. No hectic, nor sweats. Very slight discharge from wound of excision, which has nearly closed. Bed-sores healing. Has gained flesh. Both knees crippled by false ankylosis, owing to long flexion. Passive motion of them, however, is improving daily. Moving the hip gives no pain.

His ultimate recovery seems no matter of doubt. He was so near death at the time of the operation, that great fears were expressed whether he would survive it.

CASE V.—*Excision of the Hip. Recovery.*—(Service of Dr. CHEEVER.) Martha S., æt. 6 years, entered the hospital Feb. 23d, 1867, with the following history:—

Nearly a year before entrance, she complained of pain in the knee, followed after a time by pain in the hip, which increased to such extent that, in November, 1866, six or seven months after the first attack, she was no longer able to stand upon the affected limb, and was confined to bed most of the time. She had always had a feeble constitution, and at the time of admission was very delicate. Her mother had died of phthisis.

On entering the hospital, the right limb was continually adducted, the toes being inverted, and the slightest efforts at abduction giving pain. There was no appreciable shortening. Bowels constipated, and appetite variable.

Until March 1st, the patient remained in bed, with extension by a five-pound weight applied. *R. Olei morrhuae, ʒ ss. t. d.*

March 1st.—Sayre's splint adjusted. Sat up three hours.

3d.—Extension in bed resumed, as it is more comfortable than the splint.

10th.—Continues comfortable. *R. Elix. bark and iron, ʒ ij. t. d.*

15th to May 7th.—Extension continued, without decided beneficial effects. Sayre's splint adjusted again May 7th.

20th.—Hip was so excessively tender that the splint was kept on only about a week. The joint seems more tender, and the deformity is increasing. The head of the femur is out of its socket, and the two contiguous surfaces are rough and denuded.

The question of performing the operation of excision of the head of the femur was now seriously considered. Three months of rest and extension had been productive of no benefit. Were it possible to have the patient treated by a long-continued expectant method, and under the best hygienic influences, the case might be fairly left to nature, and recover ultimately with ankylosis. On the other

hand, the circumstances of the child's friends rendered it impossible for them to take care of her, and carry out treatment. Abscess, sinuses, and perhaps death, must be an early result of letting her walk round, and of neglect.

Under the circumstances, it was not deemed precipitate to operate, even though no evident abscess existed.

The operation was performed in the presence of many members of the Massachusetts Medical Society, June 4, 1867.

A V-shaped incision was made over the trochanter major, the apex pointing downwards. The head of the femur was found to be denuded over almost its entire surface, and the disease extended to the brim of the acetabulum. The head of the femur rested on the upper and outer lip of the acetabulum; and about two drachms of pus were found around the joint. The cup of the acetabulum was filled with fungous granulations, and not carious. The diseased portion of the ilium was left to exfoliate. The femur was sawed by means of a chain saw, below the trochanter major, and a piece removed an inch and a half long. The cancellous structure was found to be very soft. Some of the adjacent softened and degenerated tissues were removed, two ligatures were applied, and the wound left open. There was very little hæmorrhage. Patient was placed in bed, on her left side, without apparatus. Evening.—Pulse 140, regular. Very little pain.

June 5th.—Patient feels bright and playful. She takes milk freely. There is no vomiting, and no pain in wound. Patient altogether as comfortable as before operation.

6th.—Sleeps well at night. Cheerful during day. Pulse 140. Strength fair. Tongue furred and moist. Wound has commenced to suppurate.

9th.—Patient has had so little pain that only one or two opiates have been required since the operation. The wound is clean.

10th to 30th.—Continually improving.

30th.—Leg can be moved considerably without discomfort.

July 5th.—Sits up in a chair, and stands on sound limb. Is able to move about the bed. Wound 3 inches by $\frac{3}{4}$ inch.

10th.—Doing well. No soreness. Discharge very slight. Wound nearly closed.

20th.—Steadily improving. Creeps about the ward. Ulcerated surface 2 inches by $\frac{3}{4}$ inch.

30th.—Patient has some power of motion in the affected limb. Is beginning to walk on crutches.

Aug. 2d.—Very comfortable. Walks about the ward a little with crutches, and can bear considerable weight on the foot.

10th.—Improving. Wound nearly closed; very little discharge and no pain. Appetite good, functions regular, and spirits excellent.

15th.—Walks with crutches very smartly, bearing some weight on the right limb. Can stand without support. No pain on motion of leg. Wound nearly closed, and no dressings required.

25th.—Hops about ward without crutches. No pain.

Sept. 3d.—Patient can walk without crutches, but with a limp. Can nearly bear weight of body on affected limb. Health and strength improving. Wound almost closed. No pain or tenderness about hip. Shortening of right limb, one and a half inches. She was discharged; three months after operation.

These two cases were in striking contrast with each other. In the first, the disease had advanced to the limits of endurance, and the patient was hanging between life and death. In the second, the joint was excised before an abscess, of any magnitude, had formed. Both cases resulted favorably.

CASE VI.—*Impermeable Stricture of the Urethra; Perineal Section by one stroke of the Knife, without Dissection.*—(Service of Dr. CHEEVER.) The patient, 44 years old, has had stricture for seven years. Entered the hospital June 5th, at one o'clock in the morning, with retention for thirty-six hours. The catheter could be passed only to the root of the penis, when it brought up suddenly and completely, without entering the bulb. There was swelling and oedema, with redness and induration of the scrotum, but no appearance of extravasation in the perinæum or over the abdomen. The bladder was tapped through the rectum, and a quart of urine drawn. The catheter was fastened in.

The next day an abscess was opened in front of the scrotum, and a good deal of pus and infiltrated urine evacuated. The patient's condition improved much after these measures; but the urethra remained impermeable, and it was evident that a radical operation would be required to ensure permanent relief.

June 7th.—He was etherized and placed in the position for lithotomy. No staff could be introduced. Instead of dissecting down for the membranous urethra in the usual way, perineal section was done, as follows.

The forefinger of the left hand, with the palmar surface uppermost, was introduced into the rectum, and the tip of the finger placed at the apex of the prostate gland. A long, narrow, single-edged amputating knife, with a blade of four inches in length, was held, with the cutting surface uppermost, in the right hand. The point was entered in the median *raphé*, half way between the perineal centre and the anus, and pushed straight in until the point could be felt impinging on the tip of the left forefinger. Guided on this, as on a director, the back of the knife sliding over the finger, with a thin, but perceptible septum of the wall of the rectum between them, the point of the knife was pushed straight on into the bladder. A pint of urine followed the knife, and a very little venous blood. The bladder was thus opened by a single incision, without withdrawing the knife; and the incision being exactly in the median line, but few vessels were cut. A catheter was fastened in.

The patient made a more prompt recovery than is usual after perineal section. In four weeks, he took a No. 8 catheter by the urethra. In five weeks he was discharged, passing a bougie himself. In seven weeks, the perinæum was closed.

In all those cases in which we have seen perineal section performed by dissection, *without a guide* in the urethra, and in several cases in which we have so performed the operation ourselves, fully an hour has been consumed in finding the membranous urethra. The perinæum has been very much cut up by repeated, though minute incisions; a wound has been left, lacerated rather than incised, and hence slow to heal and prone to slough; and the patient has been left in a state of very considerable exhaustion from prolonged etherization and hæmorrhage. In all such cases recovery has been slow, and the perinæum reluctant to close. Perineal section of the membranous urethra, done without a bougie or a staff, in a case of impermeable stricture, has been notorious among all surgical writers as a long and difficult operation.

By the method above described, advocated by Mr. Cox, we substitute a minute or two for an hour; and a single, clean median incision for a prolonged hacking of the parts. Due care being taken to start in the median raphé, to use a single, deliberate and unswerving thrust with a long, narrow and single-edged knife, it does not seem to me that this mode of operating is as difficult as, or more dangerous than, the ordinary way.

Sir Henry Thompson, in his admirable work on Lithotomy, insists again and again that far more danger results from laceration in the vicinity of the neck of the bladder, than from the most free incisions. In speaking of the dangers of urinary extravasation after lithotomy, he says (pp. 87-88):—"There is good reason to believe that, in most cases; urinary extravasation is not the primary cause of the inflammation, but *vice versâ*. Cellulitis, produced by violence, has first destroyed the connections of the tissues, and then the urine infiltrates into the disintegrated parts. . . . Infiltration by no means necessarily occurs when urine passes over free incisions of cellular spaces, so called. In fact, cellular *interspaces* between muscles do not exist, except when made by the dissector, &c."

"It appears that, in the majority of cases, death is due to unnecessary violence inflicted on the neck of the bladder, and the parts adjacent, occasioning destructive inflammation of the connective tissue, and of the network of minute vessels that pervade it."

Neither does he consider that urinary infiltration will necessarily follow an incision carried beyond the fibrous capsule of the prostate. Such an incision is always made in the operation for lithotomy in children, in whom the prostate is only rudimentary, and yet urinary infiltration in them is very rare.

Now it is precisely an analogous series of lacerations and vio-

lence which is inflicted on the cellular tissue of the deep perinæum in the ordinary search for the membranous urethra *sans guide*; hence its indisposition to close. Neither does it appear that any serious peril will necessarily follow a clean incision, prolonged even through the prostate itself.

CASE VII.—*A Foreign Body, unsuspected for three years, removed from the Side; Recovery.*—(Service of Dr. CHEEVER.) Mrs. —, aged 27, was first troubled three years ago with a pain in her left side. Three months later, she noticed a projection of the lower ribs, just over the stomach. This state of affairs continued until a year ago, since which the pain and swelling have increased. The pain is throbbing, and requires the daily use of opiates. Since four months past, it has begun to wear upon her health. The ribs are much more prominent than on the other side. The skin is neither adherent nor inflamed, though discolored by many applications. There is great tenderness on pressure. A lateral curvature of the spine, towards the left, exists in the dorsal region. There is a general fullness over the left side. Just outside the swelling is a scar, where she had caries of a rib when a child. There are no signs of any organic disease to be discovered. The lung is resonant, and respiration good down to the very line of the swelling. The form is distorted from the spinal curvature. Position and sounds of heart normal. Tongue furred. Pulse 80. Bowels a little confined. The patient has consulted numerous surgeons and physicians of eminence, both in Boston and elsewhere. No satisfactory diagnosis has been given. She has suffered from polypharmacy. Our own suspicions point to one of two diseases—caries of a rib, or an old and limited empyema.

Worn out by pain, and tired of spending her time and means in fruitless medical advice, she enters the hospital, desiring some form of operation for relief. An exploratory incision having been proposed to her, she readily assented, and preferred to bear it without ether.

June 2d.—A crucial incision was made over the most tender spot. The knife came directly down on a cambric needle, much corroded, which lay across and between the ribs. No other disease was found. There were several indurated and tender spots near by, where the needle had probably laid from time to time. These were all laid open, and the external wound enlarged.

It is needless to follow the subsequent history of the case. The neuralgia gradually subsided; and she was discharged, at the end of three weeks, with every prospect of entire recovery.

CASE VIII.—*Peri-nephritic Abscess.*—(Service of Dr. CHEEVER.) C. S., aged 17, a delicate and anæmic girl, in whom the catamenia have never appeared, entered the hospital April 9th, 1867. Has

been somewhat troubled with incontinence of urine for three years; otherwise in fair health. Two weeks ago, first noticed a slight soreness over right kidney, and a small tumor growing slowly. Now, a fluctuating swelling in right lumbar region, three inches in diameter, without redness; but little tender, and having a boundary wall of lymph. No sensitiveness or deformity of spine. No weakness or paralysis of legs. No lameness or evidence of any trouble in the hip-joint, nor has there ever been. No chills, but profuse sweats within the fortnight.

She was etherized and the tumor opened, giving exit to a considerable quantity of laudable pus, free from odor. A probe could be passed in three inches, perpendicularly. No denuded bone to be found. Probe impinges on an elastic wall. The urine was examined, but nothing abnormal found.

The abscess continued discharging less and less for one month. No other symptoms presented themselves. She improved under tonic treatment, and was discharged, nearly well, May 10th.

The freedom from acute symptoms must class this collection with cold abscesses. The absence of all spinal or pelvic disease, and the depth and location of the matter, indicate the cellular tissue near the kidney as its probable source.

CASE IX.—*Peri-nephritic Abscess*.—(Service of Dr. CHEEVER.) Lizzie B., Irish domestic, aged 17, born in Boston, of healthy parentage, entered the hospital Feb. 11th, 1867. Four weeks ago, after wetting her feet, the menstrual flow ceased, and a difficulty in retaining urine occurred. This symptom at first compelled frequent micturition only; at present, however, there is complete incontinence. There is no pain, nor has there been at any time a chill. No dribbling of urine while lying down. During night, obliged to pass water five or six times, owing to pain at meatus. Pulse 90. Temperature 100°. Bowels costive. Tenderness in right lumbar region. No tenderness nor dulness at hypogastrium.

An examination of the urine resulted as follows:—"Color, orange; sediment, white, and pours like white of egg; specific gravity, 1017; acid; albumen $\frac{1}{6}$. By microscope, large amount of pus corpuscles; no blood nor casts." Treatment—Iron, oil and uva ursi.

Four days after entrance, had a slight chill during the night, followed by pyrexia. Another chill soon occurred.

March 22d.—An increased amount of pus in urine; another chill; tenderness over left kidney.

April 1st.—Chills again. Same condition of urine; no casts found. Some complaint of fixed pain in *right* renal region; heretofore pressure was needed to obtain evidence of its existence.

During the month of May, a troublesome cough (bronchitic) existed.

June 12th.—Urine examined; specific gravity 1015; sediment

less than at previous examinations, somewhat agglutinated; no albumen. Pus, under microscope.

July 7th.—Dr. Cheever examined the patient, in consultation. He confirmed diagnosis of fluctuation in right lumbar region. Fluctuation was very difficult to verify. By placing the left hand flat over the right lumbar region, closing the eyes, and having some one else tap repeatedly on the other border of the swelling, a wave could be felt. The indications of pus, from the swelling, deformity and rational signs, were more marked.

10th.—Patient having been fully etherized, Dr. Cheever introduced an exploratory trocar between the 12th rib and the crest of the ilium. Pus appeared. The large trocar was then introduced, and at least two ounces of a thick, purulent fluid, quite foetid, were discharged. The portion last appearing was thick and curd-like. A probe could be passed in, perpendicular to the surface, at least three inches. It reached a soft, elastic wall. No bone could anywhere be felt; nor was there any other evidence of disease of the spine or hip.

13th.—Increased amount of pus in urine; less pain in renal region.

24th.—Urine examined. For the first time, an abundant amount of mucous cloud is seen, containing a white deposit. The merest trace of albumen. Pus corpuscles still found under the microscope. *The amount of purulent sediment, however, has excessively diminished.*

29th.—Urine diminishing in quantity. Right leg oedematous, somewhat painful.

31st.—No albumen nor pus found in a specimen of urine passed this morning. Skin of leg tense and shining.

Aug. 4th.—Bowels becoming loose. Pulse has been almost universally above 100. Cough now became troublesome, together with soreness of chest.

Sept. 9th, she died. No autopsy.

These two cases are thought to be peri-nephritic abscesses. Both patients were feeble, anæmic, half-developed girls. Both had incontinence of urine. The first recovered; the second had pus in the urine, other organic disease, and death.

CASE X.—*Traumatic Hernia of the Omentum.*—(Service of Dr. CHEEVER.) The patient, a robust young man, received a prick in the abdominal wall, near the umbilicus, with a pocket knife. I saw him two hours after the accident. As much of the greater omentum as would fill a tablespoon was protruding through the small opening made by the knife. There were no constitutional symptoms. A physician called had applied warm fomentations to the hernia. The omentum not cold, nor livid. It was washed; the wound of the parietes enlarged, and the omentum returned. The patient recovered promptly.

CASE XI.—(Service of Dr. CHEEVER.) The patient was picked up in a state of intoxication, and put in the Tombs. It was found, in the morning, that he had a wound of the abdomen, and something protruding. The wound must have been inflicted by himself, or others, over night. He was sent to the hospital. A portion of the omentum, as large as an egg, was protruding through a small hole of the abdominal parietes, near the umbilicus. It was cold, dirty, livid, and looked as if it had been out for some hours. Patient still under the effects of liquor. No constitutional symptoms. It was judged imprudent to return the omentum, and it was strangulated with silver wire. No symptoms followed, beyond an attack of delirium tremens. The omentum sloughed off in six days, and he was discharged, well.

CASE XII.—*Femoral Hernia strangulated for four Days ; Operation ; Recovery.*—(Service of Dr. CHEEVER.) Mrs. M., 40 years old, had had femoral hernia for many years. Her truss, having become worn, did not control the rupture. After working all day with the rupture down, she was awakened in the night by colicky pains near the umbilicus, followed by one stool. Next morning, the pain recurred, with nausea. No further motion of the bowels until after the operation. Vomiting of a distressing character set in the second night, with pain and constipation. The matter vomited was, first, the contents of the stomach; next, bile; next, mucus from the duodenum; then, chyle from the small intestine, coupled with a foul-smelling mass from below. The vomiting was never fæcal, nor even stercoraceous, nor have I ever seen it so. It appeared intestinal; thick, conglomerated, homogeneous, and offensive. It recurred, at intervals, for three days, with constipation, a cool, moist and shrunk-skin, and feeble pulse. These symptoms, at no time very violent, were controlled by opium; so that, in the intervals, a great apparent amelioration appeared.

After four days' delay, she consented to have an operation done. The sac was opened, the stricture cut, and the bowel, which was deeply congested, but not gangrenous, returned within the abdomen. She recovered perfectly—a spontaneous evacuation of the bowels occurring within a few hours after the operation.

The interesting points of this case were: the mildness of the symptoms for four days, and the deceptive amelioration produced by opium. We can easily conceive that a continued use of this drug might lead to a fatal delay.

The cool, moist skin, indescribable shrunken aspect, and the nature of the vomit, were the symptoms most indicative of the mischief going on unseen.

It will be understood that an operation was urged on the patient from the beginning of the case.

CASE XIII.—*Strangulated Hernia relieved by Operation; The Canal closed by wire Sutures, left in permanently.*—(Service of Dr. CHEEVER.) J. D., æt. 17, was born with double inguinal hernia, and wore a truss until he was 6 years old. From that time he had no trouble until two days since, when, on making a sudden exertion, the rupture re-appeared on the right side, and soon showed signs of incarceration. Patient had severe pain all night, and vomited three times. The following afternoon, he was seen by his family physician, who applied taxis, under ether, without success.

On being called to him, I advised his removal to the hospital, and as it was then late at night, and the symptoms not urgent, he was put to bed, with hop fomentations and a full opiate. The hernial sac lay in the inguinal canal, and the constriction was at the inner ring.

April 30th.—He was etherized, and, taxis having failed, herniotomy was performed. An incision having been made over the tumor, a hydrocele of the cord was found below the outer ring. The sac having been reached and laid open, a half ounce of serum escaped. The constriction was found very high up at the inner ring, and divided. The bowel was congested, and infiltrated with serum, but there were no signs of gangrene. The bowel having been returned, the two pillars of the canal were drawn together by a single, stout wire suture. The ends were cut short off and left in the wound, and the skin closed by one stitch.

With the exception of a mild attack of rheumatism, the case went on perfectly well. The wires kept up suppuration for six weeks before the sinus had so far closed that he could be let up with safety. Meanwhile, a large amount of lymph was effused. There was no suffering, and no orchitis. At the end of six weeks he was let up, with a spica bandage. There was no relapse of the bowel. The ulceration remaining was one inch long by one half broad. The sinus discharged thin serum.

On July 1st, he was discharged from the hospital, with the wound nearly closed, and allowed to go about without a truss.

Aug. 1st.—Three months since the operation, he reports himself well. Wound closed; no soreness; still a large effusion of lymph around the wire; no truss; no bulging of the abdominal wall, or bubonocoele. Time must prove the event.

The question to be solved, as to the use of wires after herniotomy and their permanent retention, is: on the one side, a protracted convalescence; on the other, immunity from return of the hernia and freedom from a truss—provided the wires become encysted and the occlusion of the rings lasts.

Note.—Nov. 17th, six months since the operation. The wound has re-opened, portions of the wire have been discharged, and the hernia has returned.

CASE XIV.—*Double Oblique Inguinal Hernia ; Operation for a radical Cure.*—(Service of Dr. CHEEVER.) The patient, a young man 20 years of age, has a congenital inguinal hernia on the left side, and on the right, one of two years' duration. Both are reducible, and have not troubled him much until recently. Now desires an operation.

June 14th.—The patient having been etherized and the hernia reduced, an incision, an inch and a half long, was made through the skin of the scrotum, on the left side. The skin and cellular tissue were thoroughly freed from the spermatic fascia for an inch all round the incision. The spermatic fascia and sac having been invaginated on the forefinger, the hernia-needle was passed up through the inner pillar and conjoined tendon, high up near the inner ring. The needle emerging through the skin of the abdomen was threaded with large size (No. 20) copper wire, electro-plated, and withdrawn. Next the needle, unthreaded, was passed through the outer pillar and Poupart's ligament, and up through the same opening in the skin, the other end of the wire hooked on and withdrawn, leaving the loop over the abdomen, and two free ends below, emerging from the scrotal incision. These two ends were now crossed through the spermatic fascia and sac, by passing the needle across from within outward, and threading one end and drawing it across, and *vice versa*. Finally, the needle was passed through the conjoined tendon close to its insertion, and the outer end of the wire hooked on and drawn through; then the needle was passed through the insertion of Poupart's ligament, close to the spine of the pubes, and the inner end of the wire hitched on and drawn through. We now had the loop above, the two free ends below, and, between them, a complete figure of eight, formed by two stitches through each pillar and by the crossing through the sac. The lower ends were twisted together, and drawn up into the canal by pulling on the loop above, which was then twisted down into the skin. The ends were then secured over a roller. The other side was operated on in precisely the same manner, and a double spica bandage applied over all. The patient was put to bed, with the knees flexed over a pillow. One fourth of a grain of morphia was given subcutaneously.

Moderate swelling of the scrotum supervening on the second day, the bandage was removed, and the scrotum slung. Moderate suppuration came on, but no constitutional disturbance. The wires were removed on the tenth day. The discharge had nearly ceased, and he was allowed to sit up, with a spica bandage, at the end of the three weeks. At the end of four weeks he was discharged, with a light, double Wood's truss. There was a firm effusion of lymph, and no signs of weakness on coughing.

The experience of the past year has led us to modify somewhat our opinion of Wood's operation for the radical cure of hernia, as

expressed in a clinical lecture delivered and published in 1866.* Of the twenty cases there published, we may fairly eliminate seven, as operations either abandoned (1), lost sight of (2), or performed on improper subjects, viz., very obese or too old men, and large direct herniæ (4). This leaves a total of *thirteen* fair cases. Of these, three only were then put down as successful. Two were classed as recent operations. Both these latter cases—*young men*—at the end of a year, are well. They are now without trusses, and with no evidence of relapse. This would give *five* entirely successful cases out of thirteen, or $38\frac{1}{2}$ per cent. of success. It will be remembered that Mr. Wood claims a percentage of seventy. Should the case just narrated prove favorable, we should have 50 per cent. of success.

It is fair to conclude that the later cases of our own were operated on more thoroughly than the earlier ones. In the last case, indeed, as we have said, a much more perfect occlusion of the canal and rings was effected by additional stitches. It is fair, too, to say that the operation is as safe as any one in surgery. In twenty-one cases we have had no bad result.

As we said in the article referred to above, we repeat now—"The operation palliates, if it fails to cure. It may render an uncontrollable hernia controllable by a truss. It tends always to reduce the size of the rupture; and it gives nature a chance to restore the parts by retention and adhesion. It will cure some adult cases, if they be selected with care and judgment.

"It will fail to cure some adult cases. It affords the best chance of a perfect cure in children from 6 to 12 years of age—after infancy and the first dentition are over, and during the formative period before puberty. Nature then tends to close up the rings, and the adhesive inflammation set up by the operation, even if but temporary, is of great assistance in furthering this desirable result.

"It is true, that the same end may be sometimes attained by trusses—but they must be very faithfully applied for a long while, and an operation shortens this period essentially."

We cannot do better than to quote the following summing up of Mr. John Wood, of London, in a letter addressed to us in answer to some inquiries:—

"In children before puberty, and in young men, the success of the operation is so decidedly superior to the great uncertainty, and, when probable, the slowness of cure by truss pressure, and the symptoms are so slight after the operation, that I should not hesitate in submitting myself, or a child of mine, to it, rather than to endure the inconvenience and risk which a hernia, supported by a truss only, entails. After all, it is an operation of expediency. No man is justified in pressing it on his patient. He should lay the facts before him fairly, and leave it to him to decide."

* Boston Medical and Surgical Journal, July 5, 1866.

Synopsis of five hundred Fractures treated at the Boston City Hospital, in three years—from June, 1864, to June, 1867.

The relative order of frequency was as follows:—

Fractures of the femur,	75	Fracture of the toes,	3
“ “ clavicle,	68	“ “ body of scapula,	3
“ “ tibia and fibula,	58	“ “ coracoid,	5
“ “ humerus,	49	“ “ patella,	3
“ “ radius,	46	“ “ nasal bone,	3
“ “ radius and ulna,	35	“ “ many bones,	3
“ “ fibula,	27	“ “ spine,	2
“ “ ribs,	23	“ “ both femurs,	3
“ “ tibia,	22	“ “ both legs & femur,	4
“ “ skull,	20	“ “ both legs,	2
“ “ lower jaw,	14	“ “ upper jaw,	1
“ “ fingers,	11	“ “ sternum,	1
“ “ pelvis,	9		
“ “ metacarpus,	5	Total,	500
“ “ tarsus,	5		

Ligamentum patellæ, 2. Dislocat. clavicle, acromial end, 2; sternal end, 1—5.

Of 20 fractures of the skull there were—4 of the frontal bone, of whom all recovered; 10 of the vault, of whom 5 recovered and 5 died; 6 of the base, of whom all died.* Total, 20 fractures—9 recovered; 11 died. Two fractures of vault trephined—both recovered. Three fractures of base trephined—all died. One, for compression, trephined—died. Trephining, 6—of whom 2 recovered and 4 died. Three fractures of the vault recovered without trephining; 2 were fissures; in the third there was no compression. In no case of fracture of the base was there a distinct discharge of serum from the ear. In some, there was hæmorrhage.

The following cases comprise the chief points of interest.

Two cases of compound, punctured and depressed fracture of the vault were trephined, and both recovered.† In neither were there any cerebral symptoms on entrance.

CASE XV.—(Service of Dr. CHEEVER.) The first had a small, sharp cut depression, and on trephining, extensive splintering of the inner table was found, with loose fragments lying on the dura mater, which must have given rise to necrosis and meningitis, unless they had been removed.

CASE XVI.—(Service of Dr. THAXTER.) In the second case there were no cerebral symptoms until the third day, when one pupil became sluggish, and the pulse slow and intermittent. The operation found the skull very vascular from commencing inflammation, and the periosteum very loosely adherent. Splintering of the inner table; and a slower recovery than in the first case.

* Cases trephined for fractures of the vault, not known to extend to the base.

† See Boston Medical and Surgical Journal, October 4, 1866.

CASE XVII.—(Service of Dr. CHEEVER.) There was one case without fracture, with unequal pupils and rapid pulse, with great restlessness, which terminated fatally, and in which a diffused contusion of the brain was found. Minute, miliary clots were scattered through the brain in the base and near the lateral ventricles. In some of these extravasations, yellow softening had taken place.

Injuries of the skull were causes of pyæmia in two cases—of whom one died and one recovered.

CASE XVIII.—*Large Compound Depressed Fracture of Skull, terminating in Pyæmia; Purulent Deposits in the Lungs, and Death.*—(Service of Dr. THAXTER.) The patient was struck by a locomotive engine, and knocked down backwards. One hour after the accident he was conscious; skin normal; respiration 15; pulse 56, and soft; pupils contracted.

Dr. Thaxter enlarged the external wound, and found a large, depressed fracture, two inches by one, driven in and wedged. There were also three fissures. The depressed fragment was removed with a Hey's saw, and the dura mater found wounded, with brain protruding. The patient survived one week. He remained torpid, with rather a slow pulse, until the sixth day, when he had convulsions and obstructed respiration. The trouble in breathing increased until his death.

At the autopsy, it was found that the fracture had laid open the frontal sinus and extended through the cribriform plate of the ethmoid. The brain was here softened, discolored and offensive. The lower lobes of both lungs contained numerous soft, circumscribed puriform deposits, without induration, and quite offensive. The other organs were healthy.

CASE XIX.—*Fissure of the Skull, with Depression; Pyæmia; Recovery.*—(Service of Dr. HOMANS.)

Oct. 22d.—A healthy laborer, aged 28, was struck on the head by the handle of a crank, by which a ton weight was being raised. He did not become unconscious. The integuments were lacerated over the right vertex. The pericranium is torn off for a space half an inch square. One inch and a half above the eyebrow is a linear fracture of the skull, three-fourths of an inch long, and probably extending farther beneath the soft parts. The upper border is depressed the thickness of a case knife. Severe headache. Pulse 62. No vomiting. Converses rationally.

Oct. 25th.—Pulse 52. Discharge from wound; a slight rigor, followed by fever and headache.

Oct. 26th.—Sweats freely; sensation of weight at stomach, and difficulty in passing water.

Oct. 29th.—One week since accident. Complains of pain in left

shoulder and in left popliteal space. Pulse 99; skin hot; pupils alike. Profuse sweats. Wound healthy.

Oct. 31st.—Nine days since accident. In left popliteal space is a reddened tumor, without fluctuation. No injury there at time of accident. No chills since the first, but paroxysmal fever.

Nov. 1st.—Right pupil more contracted than left, but equally mobile. Pulse 66. No cerebral symptoms. Quinine and good diet ordered.

Nov. 10th.—Nineteenth day. Abscess in ham opened. Discharged several ounces of thin greenish pus, tinged with blood. Patient unable to extend right arm. Continues to sweat.

Nov. 13th.—Probe reveals a small necrosis of skull.

Nov. 21st.—Right elbow much swollen; pain in left shoulder; pain in epigastrium.

Nov. 29th.—Fluctuation over right tibia; pus evacuated; night sweats copious.

Dec. 1st.—Induration of arm less.

Dec. 5th.—Swelling of elbow subsiding. Ordered large doses of quinine for a brief period. Appetite good. Is sitting up.

Dec. 12th.—Necrosis exposed by incisions.

Jan. 10th.—He was discharged well, except a slight necrosis. Now ten weeks since the receipt of the injury.

There can be little doubt that purulent absorption took place from the veins of the diploë beneath the linear fracture. Rigor began in three days, and the tumor in the ham in nine days. The question of interfering with the trephine was seriously entertained at first, but the symptoms did not seem to warrant it.

In the first case of pyæmia, the depots were formed in the vital organs, and death followed. In this case the pus determined to the surface, and he recovered.

In another case of fissure of the skull, recovery took place promptly, and without symptoms.

CASES XX., XXI. and XXII.—*Three* fractures of the frontal bone were depressed into the frontal sinus, but did not penetrate farther. The injury was inflicted with a flat-iron in two instances, and with a brick in the third one. The frontal sinus in one case was extremely deep, and the anterior lobes of the cerebrum set back, like the Simian race. This saved the patient, who was unusually stupid, from injury of the brain. In every case the sinus granulated, and the patient recovered without bad symptoms.

The following case, also, deserves to be recorded.

CASE XXIII.—(Service of Dr. BUCKINGHAM.) A little boy, playing in a stable, was kicked in the face by a horse. There were neither shock nor cerebral symptoms. The upper edge of the orbit

was denuded of periosteum, and the orbital process of the malar bone fractured and comminuted; there was also a deep, ragged wound in the temporal fossa. The eye escaped, and so did the skull, both of which seem quite remarkable, when we consider the violence of the blow. He recovered promptly, and without necrosis.

CASE XXIV.—*Fracture of Skull opening the Longitudinal Sinus; Death.*—A boy of 9 years of age was struck on the head by a piece of joist, falling four stories. He was felled senseless, and never regained consciousness. Pulse 54, feeble; respiration 30; left pupil contracted; right, dilated. The blow was across the vertex. A large fluctuating tumor was formed. Symptoms of compression being evident after some hours, a slight opening was made, when large quantities of venous blood gushed forth. Hæmorrhage was restrained by pressure and bandaging. The pulse failed; and death occurred in three hours. No autopsy.

Three cases were complicated with hernia cerebri—of whom two died and one recovered.

CASE XXV.—*Compound, depressed Fracture; Hemiplegia and Death.*—A lad of eight years was struck on the head with a small hammer, producing a compound, depressed fracture of the right vertex, one inch and a half in diameter. Cerebral substance exudes. Perfectly conscious. Portions of jagged and depressed bone were elevated and removed. The dura mater was found lacerated. Hernia cerebri followed. Pulse 160; conscious; cheeks flushed; both pupils much dilated, and both eyes obstinately directed to the right side. They could not be diverted. The left arm and leg were paralyzed, but reflex movements could be excited. Urine voluntary. He survived five days.

CASE XXVI.—In the second case, hernia cerebri followed the use of the trephine; complete hemiplegia of the opposite side succeeded, and eventually coma and death.

CASE XXVII.—The third case recovered. A strong, healthy man, aged 29, was struck from behind with an axe, held in both hands, and with great force. He was unconscious for two hours; then had severe pain and restlessness; no paralysis; pupils alike and normal; pulse 60, full, intermitting every fourth beat. A depressed portion of the occiput, two inches square, communicating with a large lacerated wound of the scalp, was raised and removed. Dura mater scratched, but not perforated. The pulse became regular. Next day, he was delirious. On the following day, intermittent pulse, with fever. Four days after injury, pulse down to 54. No paralysis. Wound of integuments opened. Suppuration has begun. Wound black and sloughy. Dura mater bulging.

Dr. Homans, fearing compression from blood or pus, laid open the dura mater. The membrane was congested, but nothing else found. Hernia cerebri slowly extruded, until it attained the size of an English walnut. For the following week he was violent and delirious. The hernia pulsated strongly. At the end of a week he became quiet and rational. Hernia covered with granulations. Pulse 76, regular. The following week it alternated from 48 to 60. A little incoherent at times. Wound healthy. The following fortnight, pulse from 50 to 60. Dizziness only on turning in bed. Wound contracting. At the end of another fortnight he was walking about, with a pulse of 70, and regular. Improving in appetite, strength and flesh. Ten weeks after the receipt of the injury he was well, and discharged. The hernia cerebri had subsided, and was covered with sound integument. The only symptom complained of was dizziness on moving the head suddenly, and a feeling as if the brain were shaken on the injured side, at those times.

Of fractures of bones of the *face* there were only three of the nasal bones; probably because the injury is too trivial to seek hospital treatment.

CASE XXVIII.—*Fracture of the Superior Maxilla*, recognized as very rare, existed *once* in five hundred other fractures. The malar process and the antrum were broken by great direct violence. Recovery was early, and without necrosis. Malgaigne makes a special exception, in the case of this bone, to the rule about removing comminuted fragments in compound fractures. All such particles usually become reunited, if suffered to do so. The great reparative power of the upper jaw is well shown in the case of its section and displacement for polypus, in the first paper of this series.

Of the fourteen *fractures of the lower jaw*, several were double, and one triple. Only one was a simple fracture. They were usually compound into the mouth. Where double, one was near the symphysis and the other near the angle. These double fractures were very hard to keep in place. I am inclined to think that the second fracture is often overlooked. One of the double compound fractures was followed by abscess, an opening through the skin of the chin, and necrosis with non-union. In this case the bones were drilled and wired from the outside. The wires were removed in six weeks, and union was firm. There was less inconvenience and suffering than when internal wiring and splints were used.

There were three *dislocations of the clavicle*, which are alluded to here on account of their rarity. The one of the sternal end projected upwards, and the patient refused to submit to treatment. One of the dislocations of the acromial end, well known to be of very difficult maintenance in place after reduction, resulted in some tilting up and deformity.

The other one had a perfect result, and was treated by my House Surgeon, Mr. Gay, with the following apparatus of his own contriving. A pad was put in the axilla, and a sling and Fox's apparatus applied. By these means the acromion was drawn outward to receive the uplifted end of the clavicle. Next, the clavicle was held down against the pulling up of the trapezius by a strap and buckle passing under the fore-arm, and thence up over the shoulder. From this a shorter one connected it with the ring of the Fox's apparatus. A pad was placed over the sound part of the clavicle towards the acromial end, and by drawing the buckle tight, the clavicle was held firmly down in place. This was kept on about four weeks, when it was found that the bone was perfectly restored to place.

Fractures of the Clavicle were very numerous; *sixty-eight* in all. Some were comminuted, none were compound. In all, good union resulted; in many, with almost entire freedom from deformity; in many, with some projection at the seat of fracture; and in a few restless patients, or old cases, with marked deformity—thus verifying the common surgical axiom, that when broken in the middle, between the costo-clavicular and coraco-clavicular ligaments, this fracture is one of the most difficult to treat with perfect success; fracture of the lower end of the radius ranking next to it in the chances of ultimate deformity. Unlike the latter, fracture of the clavicle leaves no disability, as it sometimes does malposition.

As to treatment, three methods were used. In children, the bandage of Velpeau was found sufficient. A moderate pad was put in the axilla, and the arm drawn back and bandaged to the side, with the hand carried up toward the sound shoulder. Starch or glue was often applied to this bandage.

In adults, treated as out-door patients, Fox's apparatus was used, and frequently re-adjusted.

Adult in-patients were kept in bed on the back, where practicable, for two or three weeks. No apparatus was used, except a sling confining the arm, and a narrow pillow between the shoulders. In this position the fragments sink perfectly into place, and in these patients by far the best results were obtained. In girls and adult females such a mode of treatment should be insisted on, if they desire a perfect outline.

There were *three* undoubted fractures of the *body of the scapula*; none of the *neck* of the scapula, that could be verified.

The fracture of the body of the scapula is extremely rare. Hamilton has seen only two cases. Four cases occurred in 2358 fractures at the Hotel-Dieu, and eight among 1901 fractures in the Middlesex Hospital.

It must be the result of direct violence, and it was so in all our three cases cited. Heavy derricks or timber fell, striking the shoulder from behind. The infra-spinous portion was usually broken;

sometimes the spine. This corresponds with the statements of authors.

In fracture below the spine, the anterior fragment is pulled towards the axilla by the teres muscles and scapular head of the triceps, while the posterior fragment is drawn upwards and backwards by the rhomboid muscles.

It is difficult to keep the fragments from tilting. Nélaton and Malgaigne confess that they have never kept them perfectly in place. Our cases were treated by adhesive strips over the injury, and bandaging the arm and hand to the body. They all resulted in good prospective use of the arm.

CASE XXIX.—To cite briefly one case. The fracture ran obliquely across the infra-spinous fossa, beginning at the axillary border of the bone, just below the glenoid cavity, and passing downwards and backwards to the posterior border and lower angle. There were mobility and crepitus, and a little displacement. Great inability to move the shoulder and arm. Treatment was by broad adhesive straps, fixing the scapula and fastening the arm to the side—the patient being kept on his back. In ten days an effusion of callus could be felt, forming an oblique ridge across the infra-spinous fossa, as evident as the spine itself. In three weeks union was good.

In the treatment of fractures of the arm, fore-arm and hand, *one hundred and forty-eight* in number, splints were more frequently improvised for the occasion than reliance placed upon those ready made. To this statement the exception should be made of the use of shoulder-cap splints for the fractures around the shoulder-joint, and of the internal angular splint for the elbow. Of the former, the sized felt, cap-splints of Ahl were employed; and for the latter, the adjustable angular splints of Goodwin.

Experience and common sense seem to us to fully endorse the statement of Hamilton, that ready-made splints, carved with fenestræ, and ridges and hollows all prepared for uniform processes of bones, more often misfit than fit the broken arm; and that they are the rude appliances of the mechanic rather than the surgeon. So many circumstances of individual peculiarities, of the nature of the injury, or the amount of contusion and swelling, are to be taken into account in every case of fracture, that we can no more expect ready-made splints to fit every broken limb, than we can expect ready-made shoes to fit every foot. And we believe more harm to have resulted from the rigid application of harsh apparatus, than from leaving fractures more to time, rest and soothing applications.

The material we have found most useful is bass-wood, or white-wood, sawed into convenient lengths and widths, and planed to a thickness of from three-sixteenths to one-fourth of an inch.

Sheet tin, or tinned iron, as heavy as can be bought, was also largely used for splints, and proved most serviceable in compound fractures and excisions. Applied to the bare skin, without padding of any kind, it was the least irritating, the coolest and the cleanest splint employed. It has the advantage also of being easily moulded or cut into any shape desired.

In the fractures of children, heavy binders' board was largely used. And in fractures around the elbow joint in young persons, angular splints were moulded from gutta-percha. The only objection to its hospital use is its cost.

The splints called Crimean were very comfortable for splints of cöaptation, to be applied to restrain muscular action in fracture of the thigh, for instance. Made of separate narrow wooden splints, quilted into cotton cloth, they fit well, and can be easily washed.

It has been very much the practice in this hospital to treat fractures of the upper extremity with very little bandaging, but to leave them exposed as far as possible. The splints were held in place by three or four strips of plaster, and no roller applied. Thus the amount of swelling, the lines of the limb, &c., could be always seen, and any defects remedied early. For this use, also, the strap and buckle, made of woollen, or elastic webbing, two inches broad, has been extremely popular. It holds on more uniformly than plaster or bandage, and can be quickly loosened or tightened.

Of course it is essential, in patients treated outside the Hospital, that due caution should be insisted on lest they loosen their apparatus too frequently themselves; and in out-patients it is more prudent to sometimes put on the roller, and even to fasten it with starch or glue.

Colles's fracture of the radius, of which there were *forty-six* cases, was treated rarely by Nélaton's pistol-splint, frequently by the straight splint; but the majority, by Bond's splint. The pistol-splint has been the least satisfactory with us. The straight double splint has given many good results. Bond's splint seems to be the most comfortable; and to be reliable, if the patient can be seen often. This splint was always made extempore, for the case in hand. The shape of the fore-arm and hand, the latter abducted, is marked out on a strip of bass-wood, and then cut accordingly—sides about half an inch high, of tin, are tacked on. A piece of turned wood, or a cotton roller, is fastened at the distal end, for the metacarpus to rest over. The splint is then padded to suit the case. The fractured limb is laid in it, and confined by straps, or bandage. The thumb and fingers are left free, and the fore-arm placed in a sling. When well applied this was an extremely comfortable apparatus.

It is, of course, well understood that the result in this fracture depends very considerably on the nature and amount of injury. Some cases turn out well, and some badly, in any apparatus. The fracture

may be impacted, and permanently deformed; the amount of subsequent effusion among the flexor tendons may be large and permanent; or rheumatism may set in, in elderly patients, all of which influences may give a bad result.

Passive motion should be gently used, pretty early in the case according to our experience.

CASE XXX.—Before leaving the upper extremity it is proper to mention that one fracture was thought to be the very rare one of the *coronoid process of the ulna*. The patient, a boy of 9 years, came in with a dislocation of both bones of the fore-arm backwards. The joint fell out of place as often as it was put in. No fracture of the lower end of the humerus, condyles or olecranon could be made out. And as a proof that something more than ordinary dislocation backwards had occurred, the arm, placed on an angular splint, became ankylosed (false ankylosis); did not regain its power of motion when it was moved (and it was moved early), and required the usual treatment of several weeks of passive motion to restore its functions. We mention this case with diffidence, well knowing that the existence of this fracture is disputed; and having suspected it in another case, where early mobility of the joint proved that we were mistaken.

CASE XXXI.—There was one case of *Fracture of the Sternum*. The patient, while fresco painting a church ceiling, fell to the floor, a distance of 40 feet, striking on the backs of the pews, and being also bruised by having the planks of the staging fall on him. He sustained a fracture of the 5th and 6th ribs, at their middle. He also had a fracture of the sternum, displacing the manubrium from the body of the bone. The upper end of the lower fragment projected upwards. He had great pain in deglutition as well as in inspiration. There was a good deal of constitutional shock the first twelve hours. He rallied, under the use of stimulants and opiates. A broad, tight bandage was applied around the chest, which gave much relief.

In three days he was able to sit up. In one week he was discharged, at his own request, relieved. There was neither pleurisy nor pericarditis.

CASES XXXII–III.—Two *Fractures of the Spine* have been fully reported before:* we will only allude to them now. Both occurred near the junction of the cervical and dorsal vertebræ. Both occurred from considerable falls on the back and occiput. In each there was complete paralysis below the nipples. The respiration was purely diaphragmatic. There was priapism and retention. The mind

* Boston Medical and Surgical Journal, January 31, 1867.

clear. The pulse, in the first case, sank to 44, full and soft. The respiration was obstructed by meteorism of the bowels. The breathing became more and more shallow, until he died, 50 hours after the accident.

The second case was trephined over the injury. Segments of the arches of four vertebræ were removed. The respiration became thoracic. The intercostals in good action. He survived until the following day, when he had emphysema and obscure respiration, with a tympanitic percussion, a pulse of 160, short, catching breathing, and death. We think the latter immediately due to fracture of ribs and pneumothorax. There was no autopsy.

There were nine *Fractures of the Pelvis*. Of these, five were fractures of the crest of the ilium, or of the anterior superior spine. In three cases the patients fell from a height, striking on the side of the pelvis. In two, they were caught between cars, or timbers. All of these cases recovered perfectly in from two to four weeks. In none was there any injury of the viscera. Treatment consisted of rest in bed, and sometimes a broad bandage, but not always.

One patient was thrown backwards from a horse, and sustained a fracture, or partial dislocation of the sacro-iliac synchondrosis. There was deformity, and inability to stand. No paralysis. He was treated with the pelvic bandage. He recovered so as to move about in three weeks, but with a little shortening of the leg of the injured side.

One case, fully narrated in the Boston Medical and Surgical Journal for May 3, 1866, was a fracture through the os innominatum, caused by falling four stories. The fracture started from the crest of the ilium and ran downwards, and was met, at the acetabulum, by a fracture of the ramus of the ischium and pubes, running upwards. The whole fractured piece of the os innominatum was movable on the rest of the pelvis. There was no complication with the viscera. Recovery took place in five months, with shortening of the affected limb, and sciatica.

The remaining two cases were both complicated with rupture of the urethra, or bladder, and terminated fatally. They are worthy of brief recital.

CASE XXXIV.—A boy of 11 years got caught between the bunters of two railroad cars, and his pelvis crushed. He was not brought to the hospital until twenty-four hours afterwards. He was quite conscious, and seemed to be suffering mainly from retention of urine. There were contusions on each hip. The lower part of the abdomen was tense and dull on percussion. No urine passed since accident. Pulse 140. Ineffectual attempts were made to pass a catheter. Under ether, the catheter could be passed as far as the prostatic portion, where a false cavity seemed to exist. With the finger in the rectum, the catheter could be felt with such a thin sep-

tum intervening, and moved about so freely, that great laceration of the urethra was evident. No prostate could be felt. A fracture of the pubes was made out, to the left of the symphysis. A dissection was made down into the perinæum, by Dr. Cheever, until urine flowed freely. The bladder being thus collapsed, and the membranous and prostatic parts so torn, no catheter could be got into the bladder. He was left to drain through the perinæum.

The following day it was found that urine had ceased to flow by the perinæum, and the bladder was again distended. Constant vomiting and great prostration. The bladder was now opened over the pubes, with a curved trocar. Urine flowed freely, and an elastic catheter was introduced to act as a syphon. The patient sank and died the same afternoon.

The autopsy revealed a separation of the symphysis pubis; a fracture a little to the left of the symphysis; and two symmetrical fractures of the rami of the ischium just in front of the tuberosities. The bladder was empty. The neck of the bladder and prostate entirely torn across.

CASE XXXV.—A strong man had the pelvis caught between a schooner and a tug boat. The pulse was rapid, quick and feeble; the skin cool and moist; aspect collapsed. Severe pain across the pelvis, increased by any motion of the body, or of either leg. Some relief was given by strapping the knees together. Brandy and morphia were given.

He was etherized, and a separation of the symphysis pubis, with mobility and fracture of the left os innominatum was clearly made out. A catheter could be passed down to the membranous urethra without difficulty; then it seemed to push into a free cavity, but no urine could be obtained. Warm water was injected, and returned bloody. The patient was in such a collapse that further attempts were desisted from. Complains of intense, burning pain in abdomen, which is tense and tympanitic. Respiration entirely costal. He gradually became pulseless; the body cold, but the abdomen hot, and died seven hours after the injury. No autopsy could be obtained. Whether death was due to rupture of the bladder and extravasation into the peritonæum and shock, only, or whether there was rupture of any other viscus, or a bloodvessel, also, we cannot now decide. We may fairly consider the question, whether in another so desperate case it would not be proper to cut over the pubes and search for the bladder there, if we failed to give relief through the perinæum.*

Of the series of nine pelvic fractures, only one third were serious, and but two died.

* See case by Dr. Wm. J. Walker, in his treatise on compound and complicated fractures; also several reported in Eve's Surgical Cases.

Seventy-five *Fractures of the Femur* are enough to furnish some basis for a comparison of results.

To speak, first, of simple and uncomplicated fractures, they occurred at all ages and in all parts of the femur. Treatment, with very few exceptions, soon settled down into the following uniform course. The apparatus to be described is a modified combination of the methods of Buck and Liston.

First—*Extension* was made by strips of adhesive plaster carried above the knee, up to the seat of fracture, and down below the foot, on each side. They were retained by spiral turns of plaster and by bandaging. The lower ends were attached to a cord, passing over a pulley, and suspending a weight of from five to fifteen pounds, according to the age of the patient, or his muscular power.

Second—*Counter-extension* was made solely by raising the foot of the bed four inches.

Third—*Rotation* was prevented by a long, outside splint, extending from above the pelvis, below the foot. This was lightly bandaged on from the ankle to the groin, and ended in a few turns of the single spica, around the trunk. Sand bags were sometimes added.

Fourth—*Splints of Coäptation* were applied around the muscles of the thigh, next the skin, and secured by broad straps and buckles. The advantages of this method are steady, persistent extension, and freedom of the perinæum from any counter-extension; comfort and ease to the patient; no sloughs, and good average results.

Shortening rarely exceeded three-fourths of an inch; often it was much less. No adult escaped without some shortening; many of the children had, however, no perceptible difference between the two legs. In none of the simple fractures were there any sores, or sloughs from the apparatus.

Non-union, originating in the hospital, occurred only *once* in the five hundred fractures. The double-inclined plane was used for some fractures near the hip. The double-inclined plane, combined with extension by weight in the axis of the femur, the pulley being at a height of five or six feet from the floor, according to the plan of Prof. Nathan Smith, was used in one case. The anterior splint of Dr. Nathan R. Smith was used in a few instances.

It was not perceived that either of these modes, in simple fractures of the femur, was more beneficial than that first described.

Intra-capsular fracture in old persons was treated by the fracture-bed, and, in some cases, by the long splint and weight, temporarily, to relieve pain. No apparatus was applied for a long time, and the patient was got up on crutches as soon as practicable. One case, in a person younger than middle age, was thought to be wholly intra-capsular and not impacted, and recovered with firm, bony union.

The majority of the cases of compound fracture of the femur were the result of such great violence, and accompanied with so

much laceration of the soft parts, that amputation was the only resort.

Cases suitable for conservative efforts did well on the fracture-bed of Dr. Crosby; and on some heavy, iron substitutes for it, contrived and modified by Mr. Cutler, the Superintendent. The great advantage of these last was, their complete immobility and their durability.

There were three cases of simple fracture of *both* femurs. One, adult, was treated in Gibson's apparatus, which consists of two crutches from the axilla to beyond the heels, and a foot-piece, by which extension can be applied to both legs. Two, in children, were treated by double, plaster extension of the two legs, terminating in one pulley, and heavy weight; and sand-bags to check rotation.

All three cases did well.

There were three fractures of the *patella*. All were treated in the straight position, with the heel raised eight to ten inches. All did well; one, *transverse*, had *bony* union.

There were *one hundred and seven* fractures of the *tibia* and *fibula*. The majority were simple, though many threatened to become compound. Pott's fracture, with dislocation of the ankle, was pretty common.

The fracture-box was used more than any other apparatus, especially in the earlier treatment; simple fractures were soon got into an immoveable bandage. Certain fractures of the tibia, threatening to become compound, were successfully treated by flexing the leg, and laying it on its side, in Mr. Pott's position, with a carved splint to steady it. After several weeks the straight, starched bandage was applied. Certain others were suspended in Dr. N. R. Smith's apparatus, with good results; and where there was simply an oblique fracture of the tibia pressing against the skin, it was remedied by raising the heel. The compound fracture of the leg depended for good or bad results on the habits and the age of the patient.

During the last six months the glue bandage of Mr. De Morgan has been largely substituted for starch. It is made of ordinary boiled glue, to which one-fifth part of alcohol is added. Its advantages are facility of application with a brush; quicker drying, greater solidity, and firmer union of the folds of bandage after being slit open, than the starched bandage of Seutin.





